

What is claimed is:

1. A program debugger, for reducing debugger impact through motion of an IV-breakpoint set within a program loop, where the IV-breakpoint and the loop are controlled by an induction variable having an induction rate that is determinable at least when the IV-breakpoint is satisfied, said debugger comprising:

- means for extracting, from program code within the loop, the induction rate;
- means for extracting, from the IV-breakpoint, a final value for which the IV-breakpoint may be satisfied; and
- means for removing the IV-breakpoint, if the IV-breakpoint is satisfied and the induction variable has a present value that would be beyond the final value upon a next iteration of the loop based on the induction rate.

2. The debugger of claim 1, further comprising:

- means for setting, at a first loop exit program position, a first reset breakpoint if the IV-breakpoint is satisfied and the present value of the induction variable would be beyond the final value upon the next iteration of the loop based on the induction rate; and
- means for reestablishing the IV-breakpoint if said first reset breakpoint is satisfied.

3. The debugger of claim 2, further comprising:

- means for removing said first reset breakpoint if said first reset breakpoint is satisfied.

1 4. The debugger of claim 2, further comprising:

2 means for setting, at a second loop exit program position, a second reset
3 breakpoint if the IV-breakpoint is satisfied and the present value of the induction
4 variable would be beyond the final value upon the next iteration of the loop based on
5 the induction rate; and

6 means for reestablishing the IV-breakpoint if one of said first and second reset
7 breakpoints is satisfied.

1 5. The debugger of claim 4, further comprising:

2 means for removing said first and second reset breakpoints if one of said first
3 and second reset breakpoints is satisfied.

1 6. A method of reducing debugger impact through motion of an IV-breakpoint

2 set within a program loop, where the IV-breakpoint and the loop are controlled by an
3 induction variable having an induction rate that is determinable at least when the IV-
4 breakpoint is satisfied, said method comprising:

5 extracting, from program code within the loop, the induction rate;

6 extracting, from the IV-breakpoint, a final value for which the IV-breakpoint may
7 be satisfied; and

8 if the IV-breakpoint is satisfied and the induction variable has a present
9 value that would be beyond the final value upon a next iteration of the loop based on the
10 induction rate, removing the IV-breakpoint.

1 7. The method of claim 6, further comprising:
2 if the IV-breakpoint is satisfied and the present value of the induction variable would be
3 beyond the final value upon the next iteration of the loop based on the induction rate, setting, at
4 a first loop exit program position, a first reset breakpoint; and
5 if said first reset breakpoint is satisfied, reestablishing the IV-breakpoint.

1 8. The method of claim 7, further comprising:
2 if said first reset breakpoint is satisfied, removing said first reset breakpoint.

1 9. The method of claim 6, further comprising:
2 if the IV-breakpoint is satisfied and the present value of the induction variable
3 would be beyond the final value upon the next iteration of the loop based on the
4 induction rate, setting, at a second loop exit program position, a second reset
5 breakpoint; and
6 if one of said first and second reset breakpoints is satisfied, reestablishing the
7 IV-breakpoint.

1 10. The method of claim 9, further comprising:
2 if one of said first and second reset breakpoints is satisfied, removing said first
3 and second reset breakpoints.

1 11. An article of manufacture comprising a computer program medium
2 readable by a computer and embodying one or more instructions executable by the
3 computer to perform a method of reducing debugger impact through motion of an IV-
4 breakpoint set within a program loop, where the IV-breakpoint and the loop are
5 controlled by an induction variable having an induction rate that is determinable at
6 least when the IV-breakpoint is satisfied, the method comprising:

7 extracting, from program code within the loop, the induction rate;

8 extracting, from the IV-breakpoint, a final value for which the IV-breakpoint may
9 be satisfied; and

10 if the IV-breakpoint is satisfied and the induction variable has a present
11 value that would be beyond the final value upon a next iteration of the loop based on the
12 induction rate, removing the IV-breakpoint.

1 12. The article of manufacture of claim 11, wherein the method further comprises:

2 if the IV-breakpoint is satisfied and the present value of the induction variable would be
3 beyond the final value upon the next iteration of the loop based on the induction rate, setting, at
4 a first loop exit program position, a first reset breakpoint; and

5 if said first reset breakpoint is satisfied, reestablishing the IV-breakpoint.

1 13. The article of manufacture of claim 12, wherein the method further comprises:

2 if said first reset breakpoint is satisfied, removing said first reset breakpoint.

1 14. The article of manufacture of claim 12, wherein the method further comprises:
2 if the IV-breakpoint is satisfied and the present value of the induction variable
3 would be beyond the final value upon the next iteration of the loop based on the
4 induction rate, setting, at a second loop exit program position, a second reset
5 breakpoint; and
6 if one of said first and second reset breakpoints is satisfied, reestablishing the
7 IV-breakpoint.

1 15. The article of manufacture of claim 14, wherein the method further comprises:
2 if one of said first and second reset breakpoints is satisfied, removing said first
3 and second reset breakpoints.